

**2010 Annual Report**

**The Summer Ecology of Greater Sage-Grouse Populations on Horn Mountain and Wildcat Knoll**



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## **Introduction**

The decline in greater sage-grouse (*Centrocercus urophasianus*) populations throughout sagebrush (*Artemisia* spp.) ecosystems in western North America has prompted the implementation of conservation plans and agreements between the private and public sector (see [www.utahcbcp.org](http://www.utahcbcp.org)). Local working groups (LWGs) have been organized across the state of Utah to develop and implement plans. One of the major objectives in these plans is to learn more about the ecology of local sage-grouse. This information will provide LWGs with important information about how best to manage conservation efforts.

The Castle Country Adaptive Resources Management LWG (CaCoARM) was organized in 2006 implement conservation strategies to restore sage-grouse populations in Carbon and Emery counties in southeastern Utah. This report is an extension of work conducted by Chris Perkins from 2007-2009. This report presents data collected during the 2010 breeding season as part of an ongoing study of sage-grouse populations on Horn Mountain and Wildcat Knoll.

## **Study Purpose**

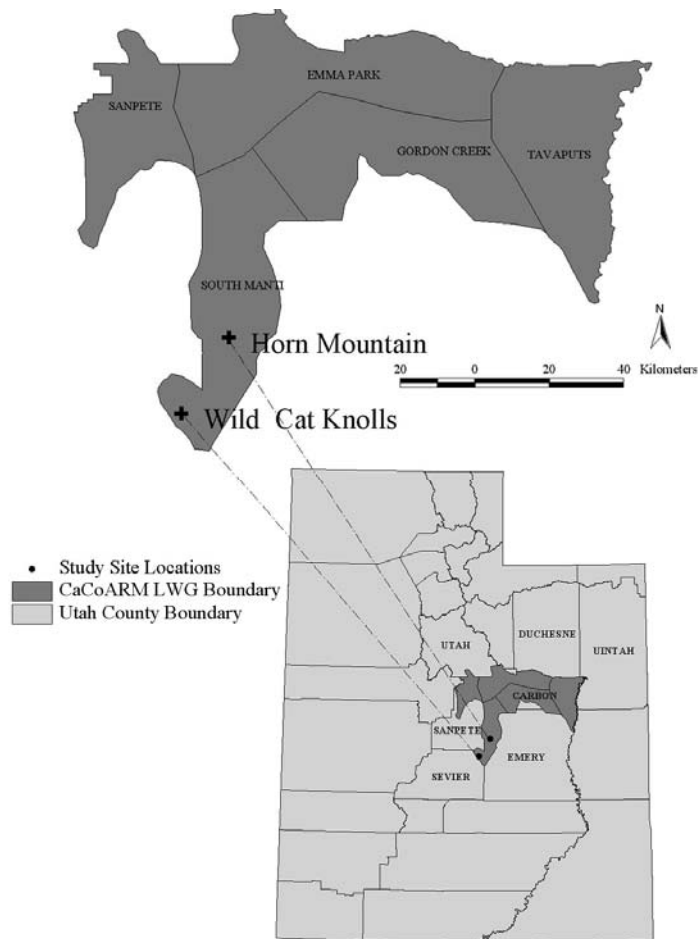
The purpose of this research is to obtain a better estimate of sage-grouse distribution, habitat-use patterns, and the factors affecting production and survival by monitoring sage-grouse that were previously radio-collared in 2007-2009. This research will provide CaCoARM, Canyon Fuel Company (CFC), the U.S. Forest Service, (USFS), and the Utah Division of Wildlife Resources (UDWR) with additional information to guide management actions that enhance habitat conditions for the greater sage-grouse populations that inhabit Wildcat Knoll and Horn Mountain.

## **Study Objectives**

- 1) To document sage-grouse 2010 seasonal distributions and habitat use on Horn Mountain and Wildcat Knoll.
- 2) To determine the factors that may be limiting or affecting sage-grouse populations on Horn Mountain and Wildcat Knoll.

## **Study Area**

The study area is located in Emery and Sevier counties on Horn Mountain and Wildcat Knoll in the Manti Mountains in southcentral Utah (Figure 1). Each of these habitats is characterized by mostly mountain big sagebrush (*Artemisia tridentata* *nut. ssp. vasayena*) and to a lesser extent by black sagebrush (*A. nova*) communities and other shrub types. Annual precipitation averages about 40 cm/year (Gooseberry Ranger Station, approximately 35 km away) with elevations ranging from 2500-2900 meters.



**Figure 1.** Location of Wildcat Knolls and Horn Mountain study areas within the Castle County Adaptive Resources Management (CaCoARM) Local Working Group Conservation Area in southeastern Utah.

## Methods

At the beginning of the 2010 breeding season, 18 radio-collared sage-grouse were alive and had functioning radio-collars. Radio telemetry methods were used to locate each of the 18 radio-collared birds. The birds were initially relocated by aircraft the first week of May, with subsequent locations recorded by myself on foot for the rest of the study period (11 May- 24 August). All birds had been fitted with radio-collars in previous years. Birds were relocated approximately twice every week from May through August. GPS locations and ocular estimates of vegetation cover for the surrounding area were recorded for each location. The status and activity of each bird was noted at each location. Hens were monitored for nesting and brooding activities. Mortalities were noted and causes were determined if possible for any bird predated.

## Results

Of the 13 previously radio-collared birds alive on Horn Mountain at the conclusion of Chris Perkin's field season in 2009 (Perkins 2010), 9 had survived to the beginning of the 2010 study. Of the 14 radio-collared birds alive on Wildcat Knoll at the end of the 2009 field season (Perkins 2010), 9 were alive at the beginning of the 2010 field season. In each area 6 of the collared birds were hens and 3 were males.

All twelve hens initiated nests and 2 nests were predated at each of the study area (66% nest success for both sites). One depredation on Horn Mountain was attributed to an avian predator and the other was an unknown mammalian predator. On Wildcat Knoll one nest depredation was attributed to an avian predator and the other was likely a coyote (*Canis latrans*).

One adult-male mortality occurred on Wildcat Knoll during the summer study period. I believe an avian predator was likely responsible for this mortality. On Horn Mountain 3 hens reared successful broods (75% brood success). On Wildcat Knoll all 4 hens were successful (100%). Vegetation analysis is currently ongoing to determine if any difference existed in habitat use or attributes for these nest and brood sites compared to previous seasons.

## Seasonal Bird Movements

Sage-grouse movements followed typical patterns previously reported by Perkins (2010), with one major exception. Bird 879, an adult female nested on South Horn 11 May and hatched 6 chicks on 14 June 2010. She later moved her brood a couple of kilometers north toward Barewire Pond over the course of a week. By 12 July she had moved her brood consisting of 2 chicks to North Horn. By early August had moved her brood across Straight Canyon to Trail Mountain, a straight line distance of 17km from her nest site. She was last observed on Trail Mountain with 24 August with 1 chick.

Over the course of this study (2007-2010) movements such as this have not been previously documented. Her movements and final location indicate that the Horn Mountain population may not be as isolated as previously believed (Perkins 2010).

## Conclusions

At the end of the summer season, 17 of 18 radio-collared birds were still alive. The nest and brooding success of the birds monitored in 2010 exceeded rates reported by Perkins (2010). Several of the birds have at least one year of bird life left. I recommend these birds continue to be monitored and additional consideration be given to recapture them and equip them with new radio-collars to determine long term survival rates and better document possible connectivity for the study population and other sage-grouse populations in the area.

## Literature Cited

Perkins, C. J. 2010. Ecology of isolated greater sage-gruse populations inhabiting Wildcat Knolls and Horn Mountain, southcentral Utah. M.S. Thesis, Utah State University, 110 pps.

## Appendix

### Individual bird summaries

#### Horn Mountain

151.721- Adult Hen- Nested May 21 near Barewire pond, hatched before June 23, clutch size: 6-7, stayed pretty close to Barewire pond until August 4 when she was found on North Horn, last seen with 4 chicks.

151.770- Adult Hen- Nested May 11 on South Horn, nest predated by unknown mammal on May 31, only found part of one egg, moved to Barewire pond area around June 23, moved to North Horn on August 12.

151.820- Adult Male- Found on South Horn May 18, moved to North Horn June 2 and stayed there the rest of the summer.

151.840- Adult Hen- Winter Mortality, found on North Horn May 17.

151.851- Adult Male- Found on North Horn May 18 where he stayed there the rest of the summer.

151.860- Adult Male- Found near lek on South Horn May 18, had moved to Barewire pond area on June 2, found on North Horn June 7 where he stayed the rest of the summer.

151.868- Adult Hen- Nested May 24 on South Horn, nest predated June 7, suspect Avian, clutch size: 7, stayed on South Horn the rest of the summer.

151.879- Adult Hen- Nested May 11 on South Horn, hatched June 14, clutch size 7, began moving toward Barewire pond area July 12 with 2 chicks, last seen on Horn Mountain near Barewire pond July 23 with no chicks, found again on Trail Mountain August 24 with 1 chick.

151.890- Adult Female- Recent Mortality, found May 17 across main road from Rock Canyon trailhead, suspect mammalian.

151.899- Adult Hen- Nested May 18 on South Horn, hatched June 7, clutch size: 8, stayed on South Horn the rest of the summer, last seen with 6 chicks.

151.912- Adult Male- Winter Mortality, found off cliffs toward Orangeville May 13.

151.941- Adult Male- Winter Mortality, found in Barewire Pond area May 11.

151.949- Adult Hen- Nested May 16 in Barewire Pond area, hatched June 7, clutch size: 6, lost brood July 5, moved to North Horn August 12 where she stayed the rest of the summer.

#### *Nests*

Initiated: 6      Nests depredated: 2      Rate: 66%

**Brood Success** 3 of 4 (75%)

## ***Mortality***

Winter: 3      Summer: 1\* (mortality occurred recently before study period). Total birds alive at the end of the field season: 8

## **Wildcat Knoll**

151.499- Adult Hen- Winter Mortality, found May 19 north-east of main area.

151.521- Adult Hen- Nested May 19 on east end, nest depredated May 26, suspect coyote, moved around Wildcat Knoll area the rest of the summer.

151.540- Adult Male- Found on south-west end of Wildcat Knoll May 20, moved to north-west end May 25, mortality July 6, suspect avian.

151.550- Adult Hen- Nested May 19 on east end, hatched June 4, clutch size: 6, moved to south end July 13, moved back to Box pond area August 3, last seen with 4 chicks.

151.590- Adult Male- Found May 20 on north end where he stayed the rest of the summer.

151.678- Adult Hen- Nested May 19 in Box pond area, hatched June 4, clutch size: 6, moved south June 17, moved north July 22 where she stayed the rest of the summer, last seen with 2 chicks.

151.730- Adult Hen- Winter Mortality, found May 20 on north end, suspect avian.

151.760- Adult Hen- Nested May 20 near lek, hatched June 17, clutch size: 5, stayed in that area until the end of the summer, last seen with 3 chicks.

151.788- Adult Hen- Nested May 20 on south-west end, nest predated May 25, suspect avian, clutch size: 7, moved between that area and Box pond area throughout the rest of the summer.

151.800- Adult Hen- Nested May 20 west of Box pond area, hatched June 8, clutch size: 5, stayed in that area the rest of the summer, last seen with 4 chicks.

151.810- Adult Hen- Winter Mortality south of Box pond area, found May 19.

151.832- Adult Hen- Winter Mortality just west of Box Pond, found May 19.

151.921- Adult Male- Winter Mortality just east of cattle guards, found May 20.

151.931- Adult Male- Found on north end May 20 where he stayed the rest of the summer.

## ***Nests***

Nests initiated: 6      Nests depredated: 2      Rate: 66%

***Brood Success*** 4 of 4 (100%)

## ***Mortality***

Winter: 5      Summer: 1      Total birds alive at the end of the field season: 8